

**M-M-R® II**  
**(MEASLES, MUMPS, and**  
**RUBELLA VIRUS VACCINE LIVE)**

**DESCRIPTION**

M-M-R® II (Measles, Mumps, and Rubella Virus Vaccine Live) is a live virus vaccine for vaccination against measles (rubeola), mumps and rubella (German measles).

M-M-R II is a sterile lyophilized preparation of (1) ATTENUVAX® (Measles Virus Vaccine Live), a more attenuated line of measles virus, derived from Enders' attenuated Edmonston strain and propagated in chick embryo cell culture; (2) MUMPSVAX® (Mumps Virus Vaccine Live), the Jeryl Lynn® (B level) strain of mumps virus propagated in chick embryo cell culture; and (3) MERUVAX® II (Rubella Virus Vaccine Live), the Wistar RA 27/3 strain of live attenuated rubella virus propagated in WI-38 human diploid lung fibroblasts.<sup>1,2</sup>

The growth medium for measles and mumps is Medium 199 (a buffered salt solution containing vitamins and amino acids and supplemented with fetal bovine serum) containing SPGA (sucrose, phosphate, glutamate, and human albumin) as stabilizer and neomycin.

The growth medium for rubella is Minimum Essential Medium (MEM) [a buffered salt solution containing vitamins and amino acids and supplemented with fetal bovine serum] containing human serum albumin and neomycin. Sorbitol and hydrolyzed gelatin stabilizer are added to the individual virus harvests.

The cells, virus pools, fetal bovine serum, and human albumin are all screened for the absence of adventitious agents. Human albumin is processed using the Cohn cold ethanol fractionation procedure.

The reconstituted vaccine is for subcutaneous administration. Each 0.5 mL dose contains not less than 1,000 TCID<sub>50</sub> (tissue culture infectious doses) of measles virus; 20,000 TCID<sub>50</sub> of mumps virus; and 1,000 TCID<sub>50</sub> of rubella virus. Each dose of the vaccine is calculated to contain sorbitol (14.5 mg), sodium phosphate, sucrose (1.9 mg), sodium chloride, hydrolyzed gelatin (14.5 mg), human albumin (0.3 mg), fetal bovine serum (<1 ppm), other buffer and media ingredients and approximately 25 mcg of neomycin. The product contains no preservative.

Before reconstitution, the lyophilized vaccine is a light yellow compact crystalline plug. M-M-R II, when reconstituted as directed, is clear yellow.

**CLINICAL PHARMACOLOGY**

Measles, mumps, and rubella are three common childhood diseases, caused by measles virus, mumps virus (paramyxoviruses), and rubella virus (togavirus), respectively, that may be associated with serious complications and/or death. For example, pneumonia and encephalitis are caused by measles. Mumps is associated with aseptic meningitis, deafness and orchitis; and rubella during pregnancy may cause congenital rubella syndrome in the infants of infected mothers.

The impact of measles, mumps, and rubella vaccination on the natural history of each disease in the United States can be quantified by comparing the maximum number of measles, mumps, and rubella cases reported in a given year prior to vaccine use to the number of cases of each disease reported in 1995. For measles, 894,134 cases reported in 1941 compared to 288 cases reported in 1995 resulted in a 99.97% decrease in reported cases; for mumps, 152,209 cases reported in 1968 compared to 840 cases reported in 1995 resulted in a 99.45% decrease in reported cases; and for rubella, 57,686 cases reported in 1969 compared to 200 cases reported in 1995 resulted in a 99.65% decrease.<sup>3</sup>

Clinical studies of 279 triple seronegative children, 11 months to 7 years of age, demonstrated that M-M-R II is highly immunogenic and generally well tolerated. In these studies, a single

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### *Nursing Mothers*

It is not known whether measles or mumps vaccine virus is secreted in human milk. Recent studies have shown that lactating postpartum women immunized with live attenuated rubella vaccine may secrete the virus in breast milk and transmit it to breast-fed infants.<sup>49</sup> In the infants with serological evidence of rubella infection, none exhibited severe disease; however, one exhibited mild clinical illness typical of acquired rubella.<sup>50,51</sup> Caution should be exercised when M-M-R II is administered to a nursing woman.

### *Pediatric Use*

Safety and effectiveness of measles vaccine in infants below the age of 6 months have not been established (see also CLINICAL PHARMACOLOGY). Safety and effectiveness of mumps and rubella vaccine in infants less than 12 months of age have not been established.

### *Geriatric Use*

Clinical studies of M-M-R II did not include sufficient numbers of seronegative subjects aged 65 and over to determine whether they respond differently from younger subjects. Other reported clinical experience has not identified differences in responses between the elderly and younger subjects.

## **ADVERSE REACTIONS**

The following adverse reactions are listed in decreasing order of severity, without regard to causality, within each body system category and have been reported during clinical trials, with use of the marketed vaccine, or with use of monovalent or bivalent vaccine containing measles, mumps, or rubella:

### *Body as a Whole*

Panniculitis; atypical measles; fever; syncope; headache; dizziness; malaise; irritability.

### *Cardiovascular System*

Vasculitis.

### *Digestive System*

Pancreatitis; diarrhea; vomiting; parotitis; nausea.

### *Endocrine System*

Diabetes mellitus.

### *Hemic and Lymphatic System*

Thrombocytopenia (see WARNINGS, *Thrombocytopenia*); purpura; regional lymphadenopathy; leukocytosis.

### *Immune System*

*Anaphylaxis and anaphylactoid reactions have been reported as well as related phenomena such as angioneurotic edema (including peripheral or facial edema) and bronchial spasm in individuals with or without an allergic history.*

### *Musculoskeletal System*

Arthritis; arthralgia; myalgia.

Arthralgia and/or arthritis (usually transient and rarely chronic), and polyneuritis are features of natural rubella and vary in frequency and severity with age and sex, being greatest in adult females and least in prepubertal children. This type of involvement as well as myalgia and paresthesia, have also been reported following administration of MERUVAX II.

Chronic arthritis has been associated with natural rubella infection and has been related to persistent virus and/or viral antigen isolated from body tissues. Only rarely have vaccine recipients developed chronic joint symptoms.

Following vaccination in children, reactions in joints are uncommon and generally of brief duration. In women, incidence rates for arthritis and arthralgia are generally higher than those seen in children (children: 0-3%; women: 12-26%),<sup>17,52,53</sup> and the reactions tend to be more marked and of longer duration. Symptoms may persist for a matter of months or on rare occasions for years. In adolescent girls, the reactions appear to be intermediate in incidence between those seen in children and in adult women. Even in women older than 35 years, these reactions are generally well tolerated and rarely interfere with normal activities.

*Nervous System*

Guillain-Barré Syndrome; multiple sclerosis; exacerbation of multiple sclerosis; myelitis including transverse myelitis; seizure; febrile seizure; peripheral neuropathy including Bell's Palsy; radiculopathy; herpes zoster; migraine; muscle weakness; hypesthesia; encephalitis

*Integumentary System*

Stevens-Johnson Syndrome; alopecia; petechiae

*Musculoskeletal System*

Arthritis

*Hematologic*

Increased erythrocyte sedimentation rate; thrombocytopenia

*Immune System*

Systemic lupus erythematosus (SLE); lupus-like syndrome; vasculitis

*Psychiatric/Behavioral*

Irritability; agitation; somnolence

*Special Senses*

Optic neuritis; tinnitus; conjunctivitis; visual disturbances

*Cardiovascular System*

Syncope; tachycardia.

The following adverse reaction has been reported with another Hepatitis B Vaccine (Recombinant) but not with RECOMBIVAX HB: keratitis.

Patients, parents and guardians should be instructed to report any serious adverse reactions to their healthcare provider, who in turn should report such events to the U.S. Department of Health and Human Services through the Vaccine Adverse Event Reporting System (VAERS), 1-800-822-7967.<sup>32</sup>

**DOSAGE AND ADMINISTRATION**

*Do not inject intravenously or intradermally.*

*RECOMBIVAX HB Hepatitis B Vaccine (Recombinant) DIALYSIS FORMULATION [(40 mcg/mL) (WITH AND WITHOUT PRESERVATIVE)] IS INTENDED ONLY FOR ADULT PREDIALYSIS/DIALYSIS PATIENTS.*

*RECOMBIVAX HB Hepatitis B Vaccine (Recombinant) PEDIATRIC/ADOLESCENT (WITH AND WITHOUT PRESERVATIVE) and ADULT FORMULATIONS (WITH AND WITHOUT PRESERVATIVE) ARE NOT INTENDED FOR USE IN PREDIALYSIS/DIALYSIS PATIENTS.*

*RECOMBIVAX HB Hepatitis B Vaccine (Recombinant) PEDIATRIC/ADOLESCENT FORMULATION (WITHOUT PRESERVATIVE) IS AVAILABLE FOR USE IN INDIVIDUALS FOR WHOM A THIMEROSAL-FREE VACCINE MAY BE DESIRED.<sup>31</sup>*

*Three-Dose Regimen*

The vaccination regimen for each population consists of 3 doses of vaccine given according to the following schedule:

First dose: at elected date

Second dose: 1 month later

Third dose: 6 months after the first dose

For infants born of mothers who are HBsAg positive or mothers of unknown HBsAg status, treatment recommendations are described in the subsection titled: *Guidelines For Treatment of Infants Born of HBsAg Positive Mothers or Mothers of Unknown HBsAg Status.*

*Two-Dose Regimen – Adolescents (11 through 15 years of age)*

An alternate two-dose regimen is available for routine vaccination of adolescents (11 through 15 years of age). The regimen consists of two doses of vaccine (10 mcg) given according to the following schedule:

First injection: at elected date